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.ed States Government **Department of Energy**

memorandum

Rocky Flats Field Office

DATE: DEC 31 1997

REPLY TO ATTN OF: AME:ESD:STR:04923

SUBJECT: Progress Report in Response to the May 14, 1997, Explosion at Hanford's Plutonium Reclamation Facility

TO: Federico Peña, Secretary of Energy

THRU: Franklin G. Peters, Acting Associate Deputy Secretary for Field Management, FM-1, HQ

Reference: Memo, Secretary to Program Secretarial Officers/Field Element Managers, subject: DOE Response to the 5/14/97, Explosion at Hanford's Plutonium Reclamation Facility, dtd 8/4/97

The Rocky Flats Field Office (RFFO) is providing this status report in response to the Secretarial memorandum on the May 1997 explosion at Hanford (referenced above). This memorandum directed field offices to implement several broad initiatives and to report back on progress at the end of the year. These initiatives included a review of storage and use of chemicals, assessment of vulnerabilities at site facilities, evaluation of the technical competence of field office and contractor personnel, and assessment of site Lessons Learned and Occurrence Reporting programs. This memorandum also satisfies the intent of Secretarial memorandum dated October 21, 1997, on the assessment of hazards associated with chemical and radioactive waste storage tanks and ancillary equipment.

On December 19, 1997, the Rocky Flats Environmental Technology Site (Site) Integrating Management Contractor, Kaiser-Hill Company, L.L.C. (Kaiser-Hill) reported to this office on progress towards completion of the Secretarial initiatives. The contractor's report covers existing Site initiatives as well as future actions needed to reduce risk and improve safety management. A copy of the progress report is provided in attachment 1. The twenty-seven enclosures to the Kaiser-Hill report are not included in this transmittal. Report enclosures can be obtained by contacting the RFFO Correspondence Control and Management Center at (303) 966-7659.

This office has also prepared a separate status report on specific actions taken to implement the Secretarial initiatives within the RFFO and to ensure implementation on the part of the contractor and Site subcontractors. This report is provided in attachment 2.

Attachment 3 provides an update on the lessons learned from the emergency response to the Hanford incident. The status of specific actions is being provided as requested in the areas of emergency management decision making, protective equipment and staffing, protective treatment of personnel, and hazards information. Nineteen Emergency Management Hazards Assessments have been completed for key high hazard facilities. The Emergency Action

Level documents for nine major facilities are scheduled for completion on December 31, 1997, with an additional nine scheduled for completion on March 31, 1998. A major emergency response exercise that tests emergency event recognition and classification procedures, the notification process, protective action, decision making, and consequence assessment is scheduled for April 30, 1998.

If you would like to discuss this matter further, please contact me at (303) 966-2025. Your staff may also contact David Lowe at (303) 966-6592 or Scott Rogers at (303) 966-6062 to discuss the technical details of this report.

for Jessie M. Roberson
Manager

Attachments:
1. Kaiser-Hill Report
2. Field Office Report
3. RFFO Actions

cc w/ Atts:
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P. Brush, EH-1, HQ
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J. Nettles, NN-60, HQ
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ROCKY FLATS FIELD OFFICE PROGRESS REPORT ON CHEMICALS AND HAZARDS MANAGEMENT BEFORE AND AFTER THE HANFORD EXPLOSION

PROGRESS REPORT ON CHEMICALS AND HAZARDS MANAGEMENT BEFORE AND AFTER THE HANFORD EXPLOSION

Kaiser-Hill Company, L.L.C., and the principal subcontractors recognize the safety issues with chemicals, reactive materials, plutonium, and enriched uranium left over in various forms from the prior production period at the Rocky Flats Environmental Technology Site (Site). Programs initiated by Kaiser-Hill, DOE, and the Defense Nuclear Facilities Safety Board (DNFSB) have been and continue to be conducted to identify risks, develop actions plans and perform risk reduction activities. All of these actions directly support the intent of DOE Secretarial Initiatives and have contributed to the safe operation of the Site. The Kaiser-Hill Team has taken many actions in advance and following the DOE direction of Reference (a)[a] and (b)[b]. This report collects and outlines the documentation associated with ongoing and completed actions, and provides a status on additional actions. The actions are summarized in this report with additional details provided in the enclosures. The actions are described to illustrate how the Kaiser-Hill team has responded to the four Secretarial Initiatives contained in Reference (b).

- SECRETARIAL INITIATIVE ONE: DOE site contractors must scrutinize their use or storage of any chemicals that have the potential for explosion, fire, or significant toxic release, and must promptly dispose of unneeded chemicals in accordance with

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[a] Keith A. Klein ltr, 04458, to Robert G. Card, Response to the May 14, 1997, Explosion at Hanford's Plutonium Reclamation Facility, September 15, 1997.

[b] Federico Peña memo to Program Secretarial Officers and Field Element Managers, DOE response to the May 14, 1997, Explosion at Hanford's Plutonium Reclamation Facility, August 4, 1997.

safety requirements and environmental regulations. DOE field offices should develop an approval process to assure the disposal or safe and environmentally compliant storage and handling of such chemicals that are retained.

- SECRETARIAL INITIATIVE TWO: DOE field offices must reassess known vulnerabilities (chemical and radiological) at facilities that have been shutdown, are in standby, are being deactivated, or have otherwise changed their conventional mode of operation in the last several years, and report status to their Program Secretarial Officers and the Assistant Secretary for Environment, Safety and Health within 120 days. Facility operators must evaluate their facilities and operations for new vulnerabilities on a continuing basis.

A reactive chemical review of the Site's buildings, cargo containers, and flammable storage areas was conducted in October 1996. Kaiser-Hill identified, treated and disposed of approximately 40 reactive chemicals as a result of this review. A copy of this review is provided in Enclosure 1.

Kaiser-Hill and DOE, RFFO signed two orders of consent with the Colorado Department of Public Health and Environment this year. One 97-08-21-01 for Idle Equipment and Tanks and the second 97-08-21-02 for Waste Chemicals. Waste chemicals are to be removed from the Site by December 1999. Instructions provided to the project managers to maintain compliance with these orders are included in Enclosure 2. The

Management Plan for Material Contained in Idle Equipment, 94-MP/IE-0017, Revision 2 is included as Enclosure 3. This plan provides instructions for adding and processing idle equipment as the Site progresses to final closure. Enclosure 4 provides the current inventory of idle equipment containing hazardous materials. The inventory contains tank, piping, valves and equipment containing hazardous materials. The inventory provides status of the items that have been processed to remove the hazards, the items scheduled for hazard removal as part of the liquid stabilization program, and the ones that have been deferred for hazard removal until decommissioning.

The Site implemented a reactive chemical management program on October 22, 1996. The status of the Reactive Chemical Program is illustrated by the figures shown in Enclosure 5. These figures show the transition of the program from reactive, to an anticipatory evaluation for chemicals for reactivity. The materials are classified as Priority 1 (P1), which must be treated or disposed within 15 days, or Priority 2 (P2), which must be treated or disposed with 90 days. P1 chemicals are generally those that are potentially shock-sensitive hazardous waste chemicals. P2 chemicals are generally those that are potentially water reactive, air reactive, cyanide bearing or sulfur bearing. These are classified by subject matter experts in accordance with the Chemical Management Manual. The program is managed in compliance with the RCRA Part B Operating Permit. A Potentially Shock Sensitive/Explosive Chemical Characterization Management and Disposal Plan was also issued June 3, 1997, which identified the proper protocol of managing the Site's reactive chemicals. This plan is provided as Enclosure 6.

The Site disposed of approximately 23,800 non-radiological waste chemical containers and packaged and shipped approximately 1,700 contaminated waste chemical containers to the Nevada Test Site (NTS) in 1997. A summary of chemical container and packaged chemicals disposal in FY97 is provided in Enclosure 7. All of these chemical management actions were underway prior to the Hanford Explosion.

In October 1996, actuators were found in Building 460, a non-radioactive machining facility that was being stripped and modified into an office facility. Each actuator was a manufactured initiating device which contains limited quantities of explosives, or a combination of strong reducing and oxidizing chemicals (approximately .25 gram of explosive material; containing lead styphnate or titanium subhydride potassium perchlorate). These devices were identified as Department of Transportation (DOT) Hazard Class 1, Division 1.4, and are activated by an electrically generated heat source.

The actuators not connected or in the presence of an ignition source are a moderate safety concern. The safety significance increases when attached to a flammable gas source or a high pressure non-flammable gas source. The issue of residual actuators on the Site was not new but active identification and disposal had not occurred. Additional actuators were located in Buildings 779 and 777 as result of the search precipitated by the Building 460 discovery. Historically, the actuators were fabricated by Mound and shipped to Rocky Flats for assembly into weapon components. The

assembly stopped in the early 80's; however, testing related to Research and Development activities continued in Buildings 779 and 777.

The actuators found in Building 460 were packaged for shipment in November 1996 and shipped to Los Alamos National Laboratory (LANL) in January, 1997, following approval of a DOT exemption. The actuators in Building 779 were contained within an explosion proof safe, posted with warning signs, and were evaluated against the existing Final Safety Analysis Report (FSAR). They were later free released, moved and packaged in a DOT approved shipping container. Representatives from the Jefferson County Bomb Squad evaluated the devices and requested them for testing and research work. Following DOE approval, these actuators were shipped to their facility in late September, 1997.

Another actuator in Building 779 was found to be part of an assembly shipped to Rocky Flats for testing. Special handling and shipping were requested and the assembly was returned to LANL in September, 1997.

Twelve remaining actuators are located in Building 777 in an enclosed glove box, within a vacuum chamber, posted with warning signs and have been screened against the existing FSAR. An initial examination of these initiators has recently been performed. All are attached to a helium filled source with an estimated internal pressure of 10,000 PSI. Actions are under way to evaluate the best method to remove them from the Site. One option being evaluated is to ship them intact to LANL. At the time of this report the

final method of disposition has not been selected but is actively being pursued. Enclosure 8 includes the plan of action for these remaining actuators.

The day after the Hanford incident, Safe Sites of Colorado (SSOC) initiated action based on preliminary information from the Hanford Site and the potential similarity of processes in Building 771 and the Plutonium Reclamation Facility. Although the details of the chemicals involved in the incident were not known, seven 15-gallon containers of hydroxlamine nitrate were located and designated for disposal. These seven containers were disposed from the Site on June 20, 1997. Enclosure 9 documents what was known as of May 15, 1997.

A letter was issued by the Kaiser-Hill Executive Vice President and Chief Operating Officer on June 9, 1997, as a result of the DOE Incident Safety Alert. The letter directed a Site review of tanks and storage containers. The initial responses covered many of the issues of interest, but specific questions still remained. Individual request to obtain supplemental information were sent out in early August 1997. The requests resulted in a thorough review of chemicals, potential for future problems and corrections in the chemical management system, chemical storage in cargo containers, and inventory of flammable storage containers. Enclosure 10 contains the documentation of the requests and responses received.

On July 14 through July 18, 1997, the DOE, RFFO conducted an assessment of Hazardous Chemical Management at the Site. One objective in the scope of this

assessment was "to verify the adequacy of contractor's actions in response to the explosion that occurred at Hanford's Plutonium Reclamation Facility." The assessment concluded that "the Site has taken prompt and comprehensive actions in response to the Hanford explosion and associated DOE Safety Alert" (Enclosure 11). This conclusion was reached prior to final responses requested in Enclosure 10, which provided details on additional actions and scope of inquiry.

A chemical procurement approval process for chemicals on Site has been established. The approval process screens chemical purchase requests for potential reactive chemicals, establishes an inventory data entry and requires special handling plans for any chemicals that pose a significant risk to the Site. The requirements of this approval process are identified in Chapter 3 of the Kaiser- Hill *Chemical Management Manual* 1-MAN-019-CMM-001. In addition, the requirements for the identification and management of potentially reactive chemicals are also included in Chapter 7 of the *Chemical Management Manual*. This Manual collects into one document a number of current procedures to make the overall system more easily understood. A copy of the *Chemical Management Manual* Revision 0, is provided as Enclosure 12.

The DOE, RFFO assessment discussed above (Enclosure 11) contained three findings, including one related to an assessment performed in 1994 for which a response was never submitted due to contract change over. Three responses were made either close-out or provide actions that will lead to closure. Enclosures 13, 14, and 15 are copies of the responses. Two key actions are to fully implement the Chemical Management

Manual by December 31, 1997, and follow with chemical safety reviews of four subcontractors between January 1, 1998, and September 30, 1998.

Kaiser-Hill and the principal subcontractors continue to address the 87 Plutonium and 28 Enriched Uranium Vulnerabilities that were identified for this Site as part of the DOE, HQ Vulnerability Assessments. Of the 87 Plutonium vulnerabilities, 15 are unconditionally closed which means the vulnerability has been eliminated, 17 are closed with acceptance of low risk after completion of compensatory measures, and nine are closed with acceptance of existing conditions being within acceptable risk levels. Of the remaining 46 Plutonium vulnerabilities, twelve have been submitted to DOE, RFFO for closure review and approval, nine are waiting closure documentation from Safe Sites of Colorado and the remaining 25 require completion of activities that are scheduled as a part of Site closure projects.

Of the 28 Enriched Uranium vulnerabilities, two are unconditionally closed, six are waiting documentation completion before submission to DOE, RFFO and the remaining 20 require completion of activities that are scheduled as a part of Site closure projects. The plan is to completely remove all the vulnerabilities, including the ones closed with compensatory measures either during closure projects or final decontamination and decommissioning. Enclosure 16 covers the status of Plutonium and Enriched Uranium Vulnerabilities as of November, 1997.

Significant progress has been made in establishing new or revised safety bases for important facilities. The August report of the DOE, HQ Office of Oversight review reflects this progress (Enclosure 17). In addition, the Site is making progress on the actions in response to the DNFSB recommendation 94-1, Reducing the Risks Associated With Plutonium Storage, Residues and Liquids. These actions are closely followed by DOE, RFFO, DNFSB Staff, and Kaiser-Hill, through weekly meetings and formal monthly progress reports.

The actions in response to the DNFSB safety concern of hydrogen generation in tanks, piping, storage containers, and waste drums have been completed. Repackaging of plutonium stored in contact with plastic, venting of drums, and draining or purging of tanks and piping have either eliminated or mitigated this safety concern. The DNFSB concern of Hydrogen generation in tanks and piping was documented specifically for Building 771. The Site elected to expand this safety concern to all Plutonium facilities and perform actions to either determine that no problem existed or to eliminate the hydrogen generation concern. A formal completion report for the first phase of the hydrogen mitigation actions was transmitted to DOE, RFFO in February 1997. Actions were completed on October 2, 1997, on the remaining piping and tanks containing organics. Kaiser-Hill believes the actions planned and completed with regard to plutonium and enriched uranium vulnerabilities, DNFSB 94-1 and the hydrogen safety concern respond to the first two Secretarial Initiatives in Reference (a).

Ongoing chemical inventories and recent completion of the Site's SNM inventory led Kaiser-Hill to believe that additional inventories would not be cost effective or have a high probability of identifying unknown reactive materials or hazards. Two actions were proposed to meet the objective of identifying new reactive materials or hazards.

First, a letter was sent to all Site personnel and retirees requesting feedback on any potential reactive materials or hazards. The letter and requested response (Enclosure 18) were coordinated with the United Steel Workers of America (USWA) to maximize the responses and to get retiree feedback on historical issues that may require additional investigation.

The initial mailing included 4,700 Kaiser-Hill Team personnel and retirees. DOE, RFFO provided mailing to approximately 280 of their Site personnel. Arrangements are underway to handout an additional 500 to the union representatives who provide construction craft skills to the Site. The action to contact as many personnel as possible has taken longer than originally anticipated. We believe that the response can be collected and follow-on investigations completed in January 1998. To date about 170 responses have been returned with ten requiring some additional investigation. No immediate hazards have been identified.

Second, a small group of long-time Site employees was assembled to search their memories for projects that may have resulted in residual hazards. This group was established on November 4, 1997 by the Executive Vice President and Chief Operating

Officer (Enclosure 19). This group completed their initial meetings and published a report including follow-on action plan (Enclosure 20). The group provided a number of areas that require additional verification that safety issues have already been addressed or included in the planning as part of the hazard analysis of the Integrated Management Process. This group may be reconvened to review issues identified from the mailing returns previously discussed.

- SECRETARIAL INITIATIVE THREE: DOE and contractor field organizations with operational responsibilities must assess the technical competence of their staffs to recognize the full range of hazards presented by the materials in their facilities, act on results, and implement training programs where needed.

During the period of March through May 1997, 181 first-line supervisors were assessed as an element of a specific corrective action plan,. This assessment evaluated technical knowledge, supervisor aptitude, error reduction skills, and work control skills. First-line supervisors for Kaiser-Hill and the three principal subcontractors responsible for operations and maintenance were included in the assessment. The assessment was conducted by Performance Improvement International to enable comparison of capabilities and standards to other organizations. The survey scope of inquiry included the supervisors management, peers, and subordinates.

The results were presented privately to the senior management of each organization because individual names were identified. An overall non-sensitive evaluation is included as Enclosure 21. In summary, the first-line supervisors scored highest for their technical knowledge; somewhat less and about equal in their supervisor aptitude and error reduction; and lowest in work control skills. Project personnel from each company prepared a packet of material for each supervisor that included the individuals results and suggested an improvement strategy.

Safe Sites of Colorado, L.L.C., implemented a reengineered selection pilot process for Building 771/774 Closure Project. This process covered 238 positions and started in October 1997. The selection process was skill based with specific job descriptions for each level. The job descriptions contain special study, required experience, and helpful experience. Weighting factors for each position were established and numerical evaluation, of each candidate was established based on interviews conducted by a three member panel.

The objective of the reengineering effort was to establish 8 team with each team consisting of the skill necessary to perform closure activities. A definition of the overall workscope and schedule for each team was provided. Enclosure 22 contains the proposed FY98 organization for Building 771/774; the Phase II and Phase III selection process job book including job descriptions and selection weighting criteria; and one sample of a team description for SNM Removal Team Definition.

The reengineering concept has a new position, Configuration Control Authority (CCA) to take the place of the current Shift Technical Advisor and Shift Manager. The selected CCAs are to be qualified for both the technical and administrative requirements. The concept is to have three CCAs assigned to day shift. One to be in control of today's activities, one backup, and one preparing the details with the eight teams for the next day's activities. One additional CCA will be assigned for offshift routine activities. Two CCAs will be assigned when nuclear activities are scheduled during offshift. The pilot of this concept in Building 771 is scheduled to start in January 1998. If successful, the concept will improve qualifications of personnel, result in more efficient operations, and be incorporated into other buildings.

The Site is also required per DOE Order 5480.20A to have a written summary of positions requiring certification or qualification. The requirements basis of the certification or qualification is defined in the Training Implementation Matrix (TIM) and documented in the master files in the Site Training Records Department. These requirements are specified in the Training and Qualification Program, 96-RF/T&Q-005, Section 3.

The qualifications and evaluations by the qualification boards of some shift technical advisors and shift managers for nuclear activities have been questioned by the Defense Nuclear Facilities Safety Board staff and DOE, RFFO as a result of oversight activities. The President of Safe Sites of Colorado, L.L.C. (SSOC), the principal subcontractor for nuclear operations, has committed to aggressively pursue shift manager and shift

technical advisor improvement. A significantly upgraded continuing training program is planned by SSOC by FY98. Position descriptions have been revised including grade increases. Full qualification boards are planned for both initial and requalification.

In addition, SSOC has committed to having a Vice President being a member for each qualification board. A number of boards are scheduled in the January through March time frame to qualify the new pilot CCAs in Building 771 as well as existing shift managers and shift technical advisors in other buildings. The effectiveness of this program will be monitored as it is implemented and discussed in subsequent reports.

- SECRETARIAL INITIATIVE FOUR: DOE field offices must assess their Site Lessons Learned and Occurrence Reporting Programs to assure that 1) outgoing information is well characterized and properly summarized, and 2) incoming information is thoroughly evaluated, properly disseminated, appropriately implemented, and tracked through formal management systems.

The Rocky Flats Environmental Technology Site (RFETS) Occurrence Reporting (OR) and Lessons Learned/Generic Implications (LL/GI) programs were placed under the same management recently in an effort to improve oversight of the programs, coordinate efforts reviewing information and events, and efficiently share information with contractors and subcontractors under the Integrated Management Contract.

The revised Kaiser-Hill LL/GI program became effective in August, 1997. Changes to the program included identification of LL/GI Points of Contact (POCs) representing the major companies or organizations at RFETS. The requirements have been implemented for the (POCs) to disseminate LL/GI information to their organizations. Examples of information distribution for the Hanford Explosion and Oak Ridge Welder Fatality are shown on Enclosures 22 and 23. The LL/GI program requires that corrective action(s) developed as a result of LL/GI information be identified and tracked in the RFETS Corrective Action Program. Self-assessment of the program has identified areas needing improvement and these items are in the process of being corrected. Some of these corrective actions include increasing senior management awareness of the importance of having an effective lessons learned program and improving the distribution and response of lessons learned through the LL/GI points of contact at the subcontractor level.

Kaiser-Hill Lessons Learned/Generic Implications (LL/GI) program personnel conduct a daily review of information sources, including Occurrence Notification Reports from across the DOE Complex, to determine if there are generic implications for RFETS. Information which may be applicable is summarized and sent to LL/GI POCs along with a brief statement about the relevance of the information. POCs evaluate the information for applicability to the companies/organizations they represent, and disseminate the information accordingly. POCs are required to send Lessons Learned documents generated by their companies/organizations for evaluation and appropriate dissemination by Kaiser-Hill program personnel.

Kaiser-Hill Occurrence Reporting Oversight personnel conduct a review of each RFETS occurrence to ensure proper categorization in accordance with DOE Order 232.1 and its associated Manual 232.1-1. The local Site procedure, 1-D97-ADM-16/01. Rev. 1, Occurrence Reporting Process, is a DOE approved document and is maintained by the oversight personnel. Training is provided to facility managers and occurrence investigators by oversight personnel with emphasis on proper categorization of events. Enclosure 24 is a copy of the training workshop. Kaiser-Hill oversight personnel communicate directly with responsible Facility Managers and attend operations meetings to discuss events that may involve questionable categorization. Additionally, these personnel monitor indicators related to timeliness of reporting, and have initiated improvements to the local program by providing approved interpretation of confusing criteria to those responsible for categorizing events. A copy of the guide for investigations in included as Enclosure 25. The new process is being used with investigators on recent events and additional training planned for personnel involved with event evaluation.

Integrated Safety Management

The primary concentration of this progress report is the identification of hazards which is an important element of the Integrated Safety Management (ISM) process being implemented at the Site. To assure safety during the Site activities, the elements of ISM are being included in all activities at the Site.

The ISM process systematically integrates safety into management and work practices at all levels. ISM integrates the identification, analysis, and control of hazards and provides feedback for continuous improvement in work definition, planning and safe performance of work. There are seven guiding principles used in the execution of ISM. These include:

1. Line Management Responsibility for Safety
2. Clear Roles and Responsibilities
3. Competence Commensurate with Responsibilities
4. Balanced Priorities
5. Identification of Safety Standards and Requirements
6. Hazard Controls Tailored to Work Being Performed
7. Operations Authorization

The five core safety management functions of ISM collectively integrate safety management at the Site. These core functions are discussed below:

1. Define the Scope of Work. Defining the scope of work focuses on the hazard or hazards associated with the activity being conducted. Specifically, the scope of work must be defined to the point that the project personnel understands the qualitative nature of the hazards posed by the work. The quantitative nature of the hazards must be understood insofar as it affects the planning of the task. The activity has been defined in enough detail when project personnel have high confidence that they have identified hazards well enough to assess hazard; and

have established sufficient controls to protect the public, the environment, the collocated worker, and the immediate worker.

2. Identify and Analyze the Hazards. Identification of the hazards is performed in sufficient detail to establish proper controls to prevent or mitigate the hazards to an acceptable level. Workers and operations personnel are involved in identifying potential hazards along with subject matter experts from the safety disciplines. This step included both identification and analysis of hazards. The analysis is performed to determine the potential severity of the consequences of the hazard, which determines the nature of the controls required (graded according to the severity of the consequences). Analyses must be graded according to the complexity and uncertainty of the scenarios and mechanisms which place the hazards in contact with people and property. Simple, straight-forward scenarios and mechanisms require little or no analysis, and complex and/or uncertain scenarios require expert analysis and modeling. The hazards have been identified when project personnel have high confidence that all of the hazards are known and understood, and the hazard consequences to the public, the environment, and collocated worker, and the immediate worker are known and understood. The hazards have been analyzed appropriately when project personnel have high confidence that they can develop crisp controls to prevent or mitigate the hazards.

3. Identify and Implement Controls. This step is the culmination of the first two steps. Establishing the controls for the hazards posed by the activity is major task.

Controls must be focused on the ability to do work safely. This optimizing process will not occur reliably unless all the stakeholders and customers of the control set can participate in selecting and discussing the controls. It is critical that establishing controls involve both floor-level workers who perform work of the type in the activity and personnel expert in developing controls for a particular hazard (or hazards). Otherwise, the likelihood is high that a set of controls will be established that will actually detract from safety, because they may be overly conservative or inappropriate for the activity or task. Teams are involved in determining the controls for high-consequence, high-complexity, or high-uncertainty hazards. Experience shows that teams of appropriately qualified people make better decisions than individuals do under these circumstances. Every effort is made to include floor-level workers on any team. Their perspective on the accomplishment of activities is especially helpful in developing the controls for hazards associated with those activities. The controls have been identified when project personnel have high confidence that the responsible facility or organization can and will conduct the activity within the control set. Authorization for the work and site-specific standards application is required.

4. Perform the Work. The preceding three steps constitute the infrastructure for safely performing the work. This infrastructure is graded to the severity of the consequences of the hazards. Depending on the nature and complexity of an activity and where it is being conducted, many other requirements may need to be met before work can be performed. Personnel are being trained and qualified.

Equipment must be tested, prepared for operation, and assessed to determine its readiness to perform the activity. Special conditions required for the activity may need to be set in place and confirmed. As specified in the controls, safety precautions must be confirmed to be in place. In addition, a new activity is evaluated in combination with existing ongoing activities for safety. Other activities that could affect this activity must be addressed, halted or modified if necessary. If work is performed safety and in such a way that builds confidence, it will continue to be performed safely. Off-normal conditions or circumstances are dealt with in a controlled fashion, with safety uppermost in the behavior of the work force.

5. Feedback/Improvement. Past work activity feedback should be used throughout task planning to learn from previous experience. The objective of this step is continual process improvement through incorporation of past and in-process lessons learned from the work being done, and the re-use of past lessons from the activity in future process improvements and the safe performance of work.

The ISM process has been used for major activities such as the Tank Draining in Building 771 and the Caustic Waste Treatment in Building 371. Direct involvement with the workers and the building personnel involved with the activities has led to hazard identification and effective controls to protect the workers, public and environment. The ISM process through an Activity Control Envelope (ACE) has been used on an environmental cleanup project for the T-1 trench. This activity is currently planned for

FY98. The hazard identification has been also implemented into the Integrated Work Control Process used to perform routine and low hazard activities.

The ISM process is being applied to all projects and has been included in FY98 Work Authorization Documents. Training on the ISM process has been provided to personnel involved with planning and performing Closure Projects. The Site is scheduled for Phase I verification starting in January 1998.

Schedule.

This report covers a number of programs that are related to the Secretarial Initiatives. Each of these programs have detailed schedules with milestones and many also have special performance measures. It is not the objective of this report to identify new or replace these contractually agreed to schedules. In addition, many of the programs are ongoing and will continue until the Site Closure Projects have been completed. The following table summarizes some of the major completion dates included in these programs.

Table 1

SCHEDULE OF MAJOR COMPLETION DATES

ACTIVITY	COMPLETION DATE
1. Full Implementation of Chemical Management Plan	December 31, 1997
2. Chemical Safety Review of Contractors	September 30, 1998
3. Removal of All Waste Chemicals from Site	December 1999
4. Evaluation of Response from Site Personnel and Retirees	January 15, 1998
5. Evaluation of Potential Hazards Identified by Long Term Employees	January 15, 1998
6. Place Pu metal and oxide generated from stabilizing solutions in a form suitable for safe interim storage.	May 31, 2002
7. Thermally stabilize and repackage all Pu oxide to meet storage standard.	May 31, 2002

In summary, the combination of the action performed before and following the Hanford Explosion along with additional actions being proposed provide the evidence of active protection of the workers, the public, and the environment. The search for potential hazards will be a continuing activity as part of the ISM process. The actions taken or planned that have been described in this progress report should minimize the discoveries of chemicals or other hazards as the Site progresses to closure.

Attachment 2

Rocky Flats Field Office Report

Response to Secretarial Initiatives Resulting from the May 14, 1997, Explosion at Hanford

The following describes the Rocky Flats Field Office's (RFFO) role towards implementation of the Secretary's initiatives resulting from the May 14, 1997, explosion at Hanford's Plutonium Reclamation Facility.

Safe Handling, Storage, and Disposal of Chemicals: The Site has developed a program to expedite the disposition of potentially shock sensitive or explosive waste chemicals. Since November 1996, approximately 73 containers of shock sensitive or explosive chemicals have been safely dispositioned. The Site's management plan for these chemicals (the "Potentially Shock Sensitive/Explosive Chemical Characterization, Management, and Disposal Plan"), which was developed in December 1996, ensures that the chemicals are safely dispositioned within fifteen days of identification. The plan requires that notifications be made to RFFO and regulatory agencies. It also requires RFFO involvement and/or concurrence on management and disposition plans for these chemicals. In addition, immediate safety measures are to be taken. These measures include cordoning off the area where the chemical is located, posting warning signs, and controlling access to the area.

According to the management plan, if a shock sensitive or explosive chemical is determined to be unacceptable for on-site treatment, the chemical will be moved to an isolated on-site storage bunker, which is authorized by the Site's Resource Conservation and Recovery Act (RCRA) Permit. RFFO concurrence is necessary for this to occur. After placement in isolated storage, a plan for identifying safe and appropriate treatment and disposal options for the chemical will be developed. RFFO will be involved in the development of this plan.

In addition, chemicals that have the potential for significant toxic release are safely managed through the implementation of the Site's Health and Safety Plan (HSP) and RCRA Permit. RFFO approves the RCRA Permit and all changes to it. RFFO conducts assessments to ensure the contractor's adherence to the HSP and the RCRA permit. In fiscal year 1998, RFFO is scheduled to perform a number of health and safety, RCRA, and chemical management assessments. The above procedures, approvals, and concurrences allow RFFO to ensure that chemicals that have the potential for explosion, fire, or significant toxic release are safely and compliantly managed and dispositioned.

Finally, waste chemicals have already been removed from a number of buildings and either dispositioned or placed into safe, compliant on-site storage. The recently finalized Waste Chemical Consent Order requires that waste chemicals be removed from all

buildings by December 1999. In addition, waste chemicals from the nine highest priority groups of buildings must be removed by June 1999. To date, two of these high priority groups have been completed, and a third high priority group is nearing completion. As each facility group is completed, RFFO physically verifies the safe and compliant completion prior to notifying State regulators

Evaluation of Vulnerabilities: On November 26, 1997, RFFO provided a status report on known vulnerabilities to the Assistant Secretary for Environmental Management (EM-1) and the Assistant Secretary for Environment, Safety and Health (EH-1) as directed by Secretary Peña's memorandum of August 4, 1997. This status report discussed the RFFO assessment of site-wide hazardous chemical management conducted July 14 to 18, 1997. The status report also identified contractor progress towards the elimination of major site hazards including plutonium, highly enriched uranium, and chemical vulnerabilities.

Recent events have raised some concern regarding the scope of current efforts to eliminate materials on site that have that potential for explosion, fire, or toxic release. For example, when RFFO staff contacted K-H personnel to discuss potentially explosive actuators on site, there was no plan or schedule for stabilization or disposal of these items (K-H staff have since drafted a plan). RFFO believes there may be additional reactive materials on site for which there is no defined strategy or plan. Therefore, RFFO has directed Kaiser-Hill to conduct an inventory of all reactive materials on site and report to RFFO on the results of this inventory along with a plan and schedule for disposition. Kaiser-Hill has developed and implemented a strategy for completing this inventory and will provide their results in January 1998.

Technical Competence of RFFO Personnel: RFFO recognizes some weaknesses exist due to the utilization of generic hazard analyses for staff training rather than those based on actual site conditions. Facility-specific hazard analyses for nineteen high-hazard facilities have been recently developed by the contractor and reviewed by RFFO. Utilizing this new information, RFFO is taking corrective actions to overcome these weaknesses. Competencies on hazard analysis and hazard recognition will be included in the recast of the RFFO Technical Qualification Program (TQP) by May 1998.

Occurrence Reporting and Implementation of Lessons Learned: RFFO conducted an assessment of the Lessons Learned Program and the Occurrence Reporting and Processing System (ORPS) on November 25, 1997. The assessment involved reviewing documents and interviewing Kaiser-Hill and subcontractor personnel to evaluate the characterization and dissemination of information across the site. The assessment team concluded that Kaiser-Hill reviews and distributes ORPS information in a timely fashion. One weakness was noted that Kaiser-Hill has not implemented the Lessons Learned Program at Rocky Flats. Kaiser-Hill relies on the ORPS system to distribute information on lessons learned from other sites rather than the DOE Issues Management System. Although this has been effective to date, information available through the DOE Issues Management System may be missed if it is not also included in the ORPS system. Based

on this conclusion, RFFO documented a finding that will be transmitted to the contractor for corrective action.

Attachment 3

RFFO Actions in Response to Secretarial Directive Issued on August 27, 1997 Related to Lessons Learned from the May 14, 1997 Explosion at Hanford

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ACTION:
Train key emergency management personnel on emergency management decision-making.

STATUS: **CLOSED**
Emergency management personnel attended training sponsored by NN-60, Office of Emergency Management on October 16, 1997. Additional training will be conducted by January 31, 1997.

ACTION:
Conduct a realistic exercise that includes and confirms decision-making capability.

STATUS: **OPEN** DATE DUE: **April 30, 1998**
By agreement between RFFO and the Office of Emergency Management, this action will be implemented as part of the annual exercise scheduled for April 30, 1998.

ACTION:
Confirm availability and qualification of critical personal protective equipment within 45 days.

STATUS: **CLOSED**
Kaiser-Hill confirmed the availability and qualification of personal protective equipment and reported the results to RFFO in memorandum 97-RF-05475, dated October 10, 1997.

ACTION:
Confirm that sufficient numbers of qualified personnel are available at all times for response and post-accident activities.

STATUS: **CLOSED**
Kaiser-Hill confirmed the availability and qualification of Industrial Hygiene staff for response and reported the results to RFFO in memorandum 97-RF-05475, dated October 10, 1997. Industrial Hygiene representatives maintain an on-call status after normal working hours, and are notified through an on-call listing maintained in the Shift Superintendent (Incident Commander) office. Radiation Control Technologist (RCT) support is confirmed available and qualified under the provisions of 10 CFR 835, and the availability on all shifts of sufficient RCTs to support response. Each shift is supported by a RCT foreman specifically designated as the first response representative to the Incident Commander.

ACTION:
Verify readiness periodically in accordance with established requirements.

STATUS: **OPEN** DATE DUE: **March 31, 1998**
Site drills have been scheduled for: 11/6/97 (completed), 1/29/98, 3/5/98, 4/1/98, 6/18/98, 8/26/98. These drills are supported by 15 tabletop drills/training sessions throughout the year. The annual exercise (READY 98) is scheduled for April 30, 1998.

RFFO Actions in Response to Secretarial Directive Issued on August 27, 1997 Related to Lessons Learned from the May 14, 1997 Explosion at Hanford

ACTION:
Review policies and procedures for timely medical attention and care after the accident with local medical authorities and workers.

STATUS: **CLOSED**
Two Memoranda of Understanding exist with local medical authorities: one with the University of Colorado Hospital, and the second with the St. Anthony's Hospital System. Both MOUs were reviewed in August, 1997, and verified as current. These MOUs stipulate treatment for potentially contaminated, injured personnel and the mechanism for radiation control support from RFETS. Procedures established by the RFETS Occupational Medicine Division were reviewed in September, 1997 as part of the overall review of the Site Emergency Plan and supporting documents. The Site Medical Emergency Response Plan is current and maintained through the Occupational Medicine Division. Recently, Occupational Medicine added a decontamination trailer at the Site medical facility. Procedures for operation of this trailer have been completed in December, 1997.

ACTION:
Conduct realistic exercises to include and confirm that procedures are implemented for notification and protection of workers in a variety of remote locations at event onset, and methods are available to control their sheltering.

STATUS: **OPEN** DATE DUE: **April 30, 1998**
This activity will be confirmed during the conduct of READY 98 on April 30, 1998 with scheduled participation by University Hospital and St. Anthony's North.

ACTION:
Train security, medical, and other emergency responders to recognize the health impact of potential accidents, including the effects of exposures to chemicals and the potential for post-traumatic effects associated with accidents.

STATUS: **CLOSED**
Emergency response personnel (first responders) are routinely trained in first aid/CPR. The Site Fire Department personnel provide fire response as well as medical response. All firefighters are EMT qualified. Agreement exists with the St. Anthony's North Hospital for physician assistance in determination of patient status and transport requirements. This activity supports medical treatment determination when the Site Occupational Medicine facility is not operating. Response time to any location on site by trained EMT personnel averages less than four minutes. Medical transport is supported by two on site ambulances, and arrangements through established Mutual Aid Agreements for offsite ambulance support.

ACTION:
Review and develop procedures to provide local medical facilities with available information on chemical and radiological hazards as well as timely qualitative and quantitative exposure information.

STATUS: **OPEN** DATE DUE: **April 30, 1998**
This activity has been coordinated with Paula Golden of St. Anthony's North and Rob Reed of University Hospital. Each of these organizations will be provided the SARA Title III Plan (Section 303) which addresses hazards associated with the Site. Training will take place in preparation for READY 98 to be conducted on April 30, 1998, which will include detection and decontamination practices, and protocols for administration of chelating agents.

RFFO Actions in Response to Secretarial Directive Issued on August 27, 1997 Related to Lessons Learned from the May 14, 1997 Explosion at Hanford

ACTION:
Conduct realistic exercises that will include and confirm the ability of the contractor to provide local medical facilities with adequate information for a variety of potential accidents to effectively diagnose and treat injured, exposed, or potentially exposed workers.

STATUS: **OPEN** DATE DUE: **April 30, 1998**
This activity will be confirmed during the conduct of READY 98, which is scheduled for April 30, 1998.